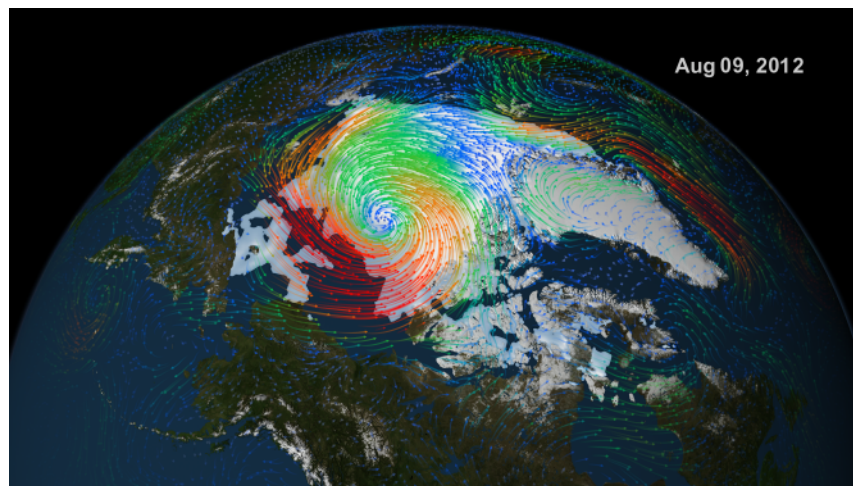




NOAA
FISHERIES

**Alaska Fisheries
Science Center**

Status of NOAA's Arctic Fish Research: the Arctic Ecosystem Integrated Survey-Ed Farley



Collaborators



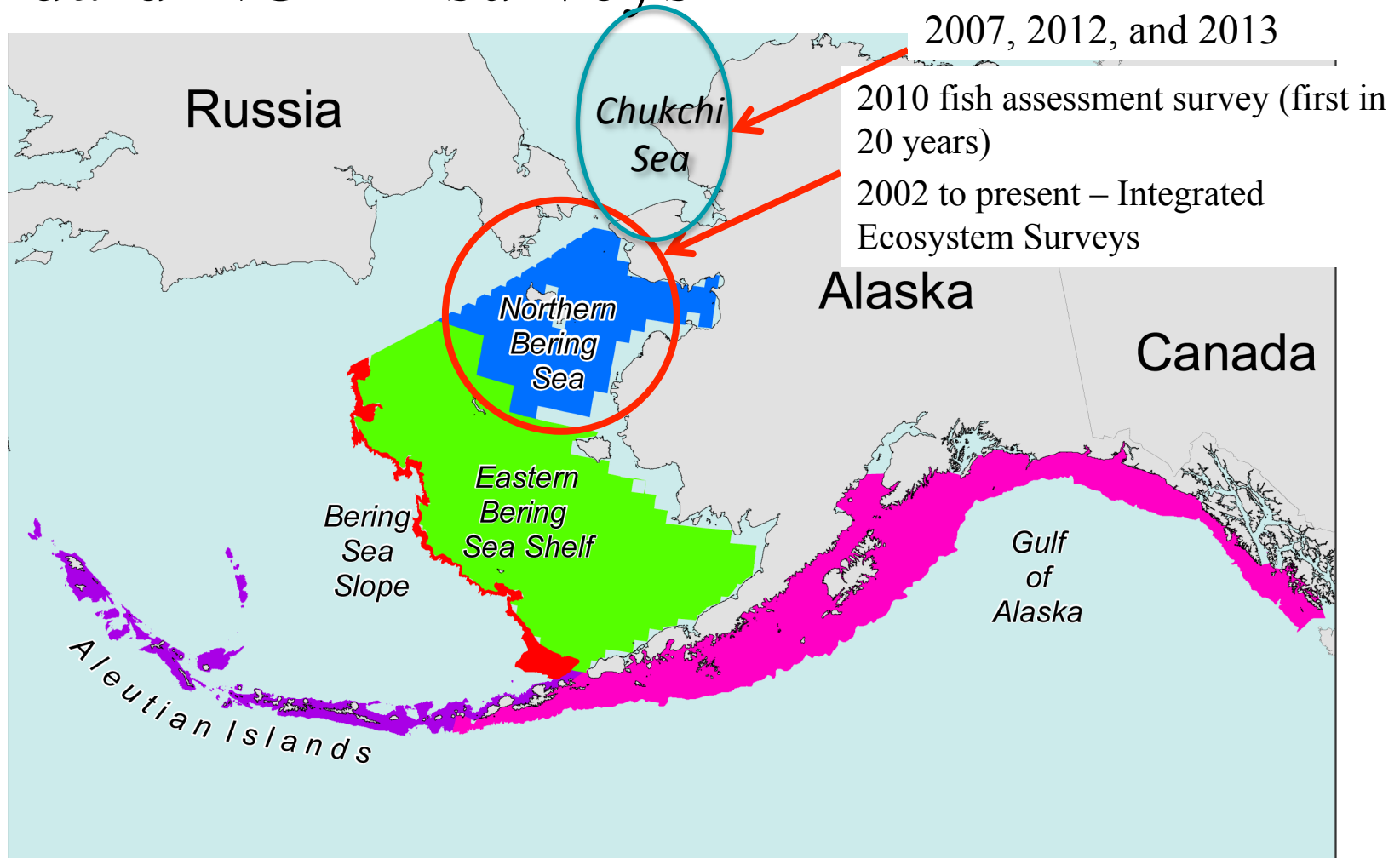
Funding Partners



Coastal Impact
Assistance Program



Loss of Sea Ice Program: Standard NOAA surveys



Arctic Ecosystem Integrated Survey

When: August / September 2012 & 2013

Where: Northern Bering Sea / Chukchi Sea

Why: Understand the distribution of marine fishes and shellfishes, and the plankton they depend upon for food, throughout the northern Bering Sea and Chukchi Sea

Knowledge and insights gained from these studies will help us to:

- evaluate effects of climate change on marine resources in the Alaskan Arctic
- protect marine resources in the region from potential effects of oil & gas development



Arctic Ecosystem Integrated Survey

Surface trawl (top 25 m)

Bottom trawl (fish assessment)



Physical oceanography



Biological oceanography



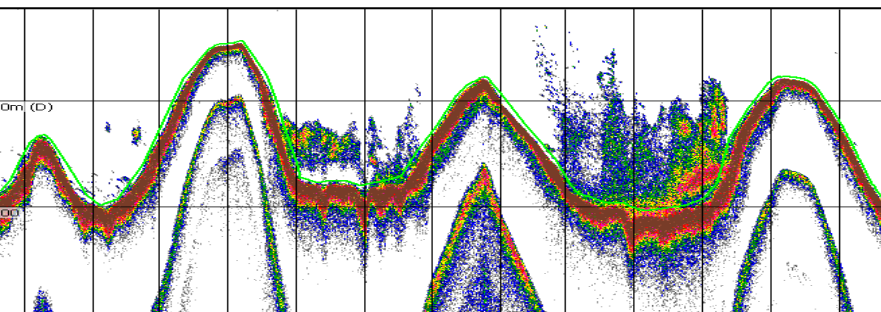
Mammals



Birds

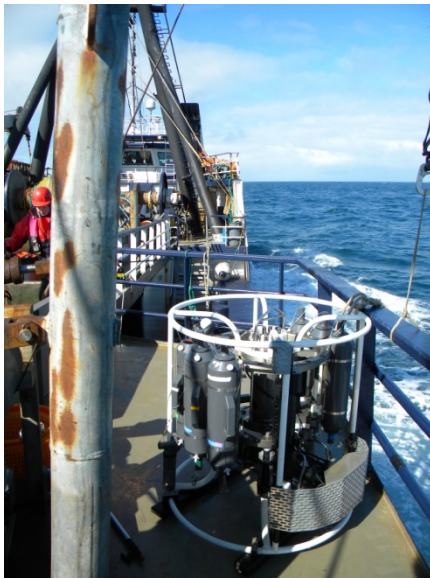


Acoustics (midwater)

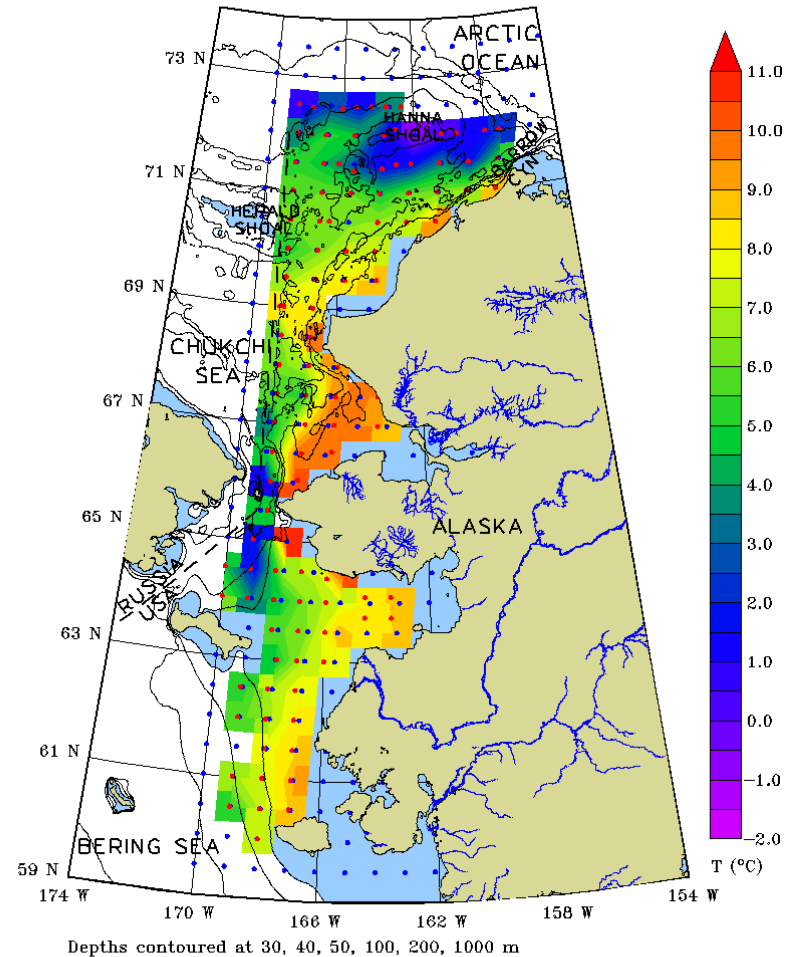


Physical Oceanography - 2012

Sea Surface Temperatures



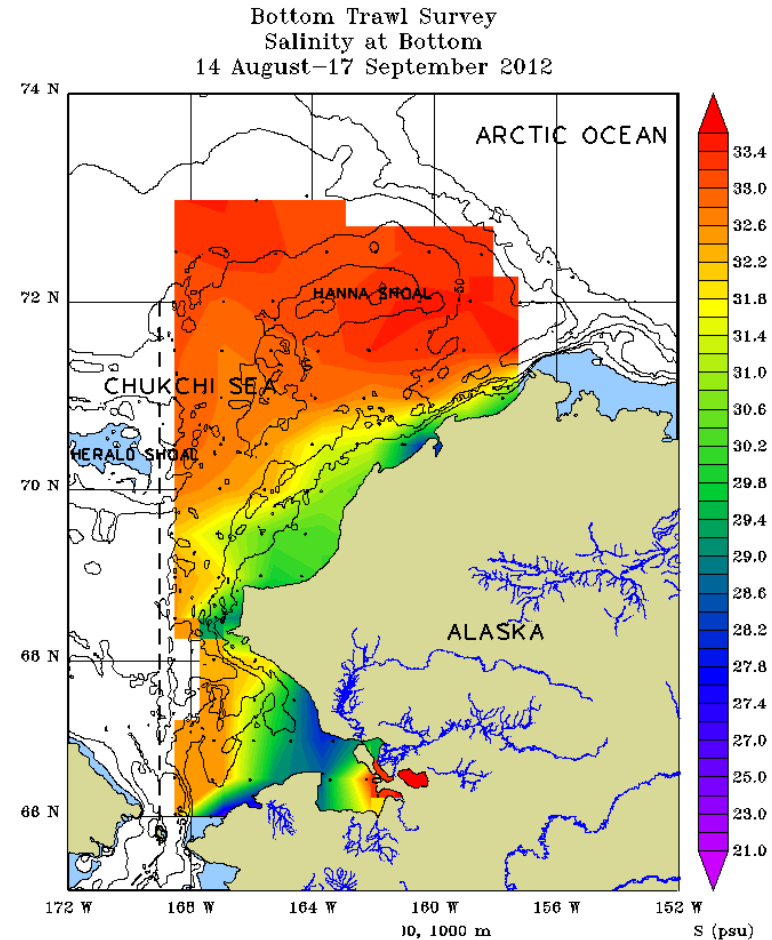
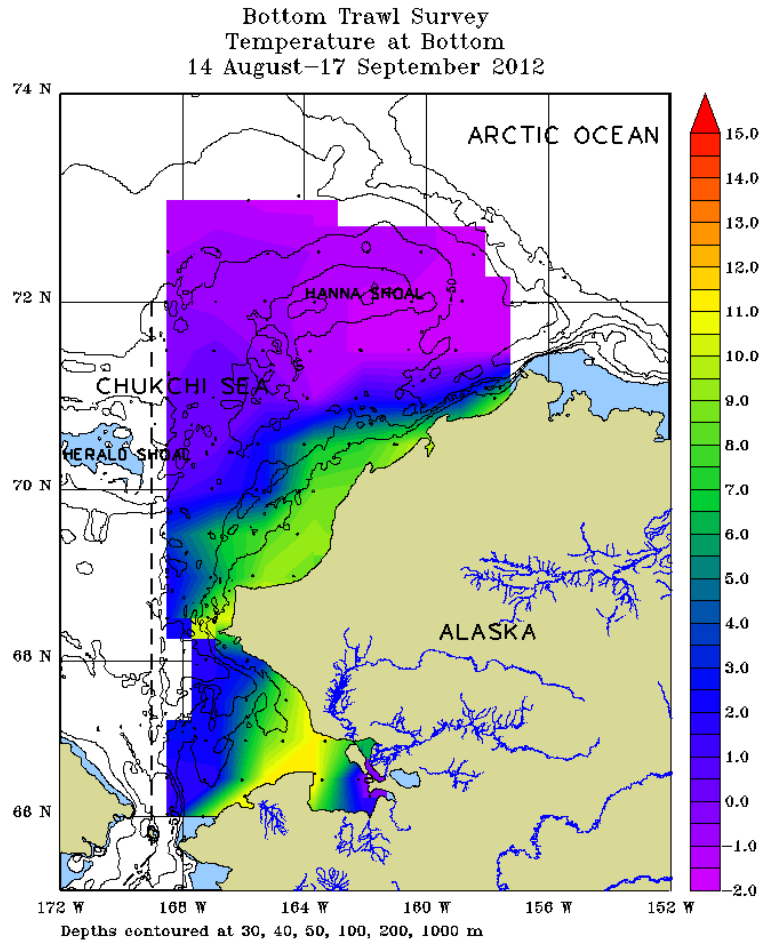
Cruise 1BE12 Temperature at 5 m
7 August–24 September 2012



E. D. Cokelet, NOAA/PMEL

Physical Oceanography

Bottom Temperature and Salinity



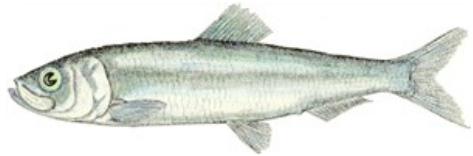
From Ed Cokelet NOAA/PMEL

E. D. Cokelet, NOAA/PMEL

Major Forage Fish/Salmon/Invertebrate Species



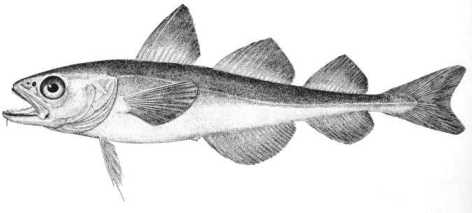
saffron cod



Pacific herring



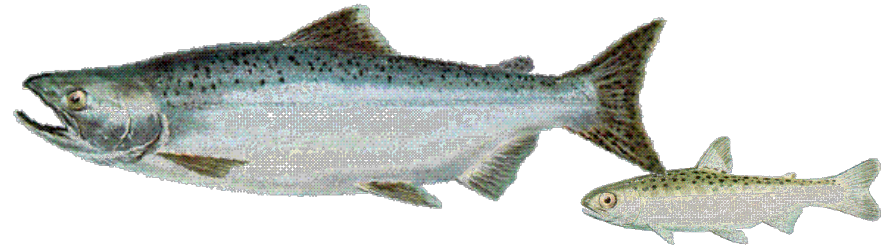
capelin



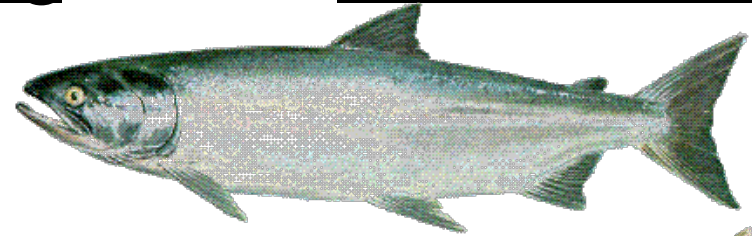
Arctic cod



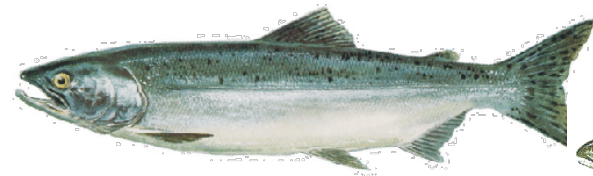
snow crab



Chinook salmon



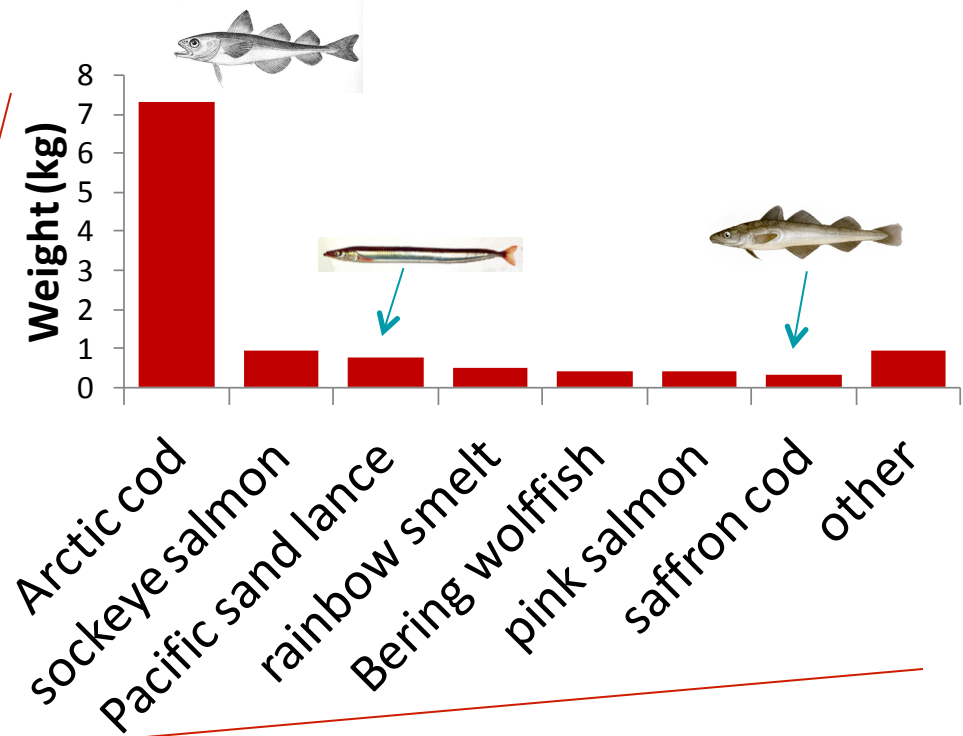
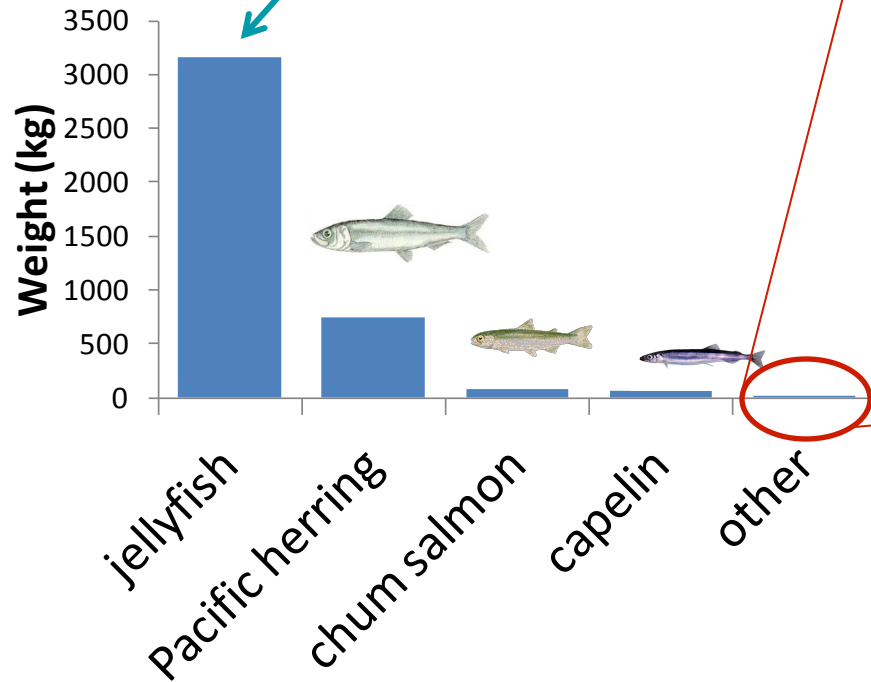
chum salmon



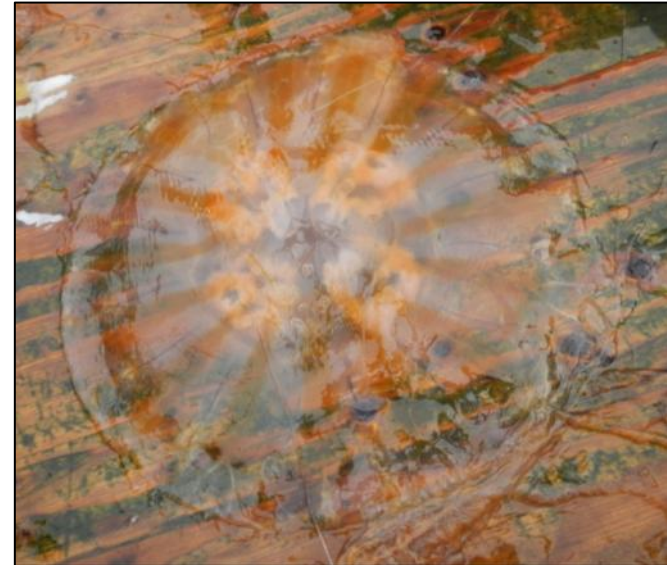
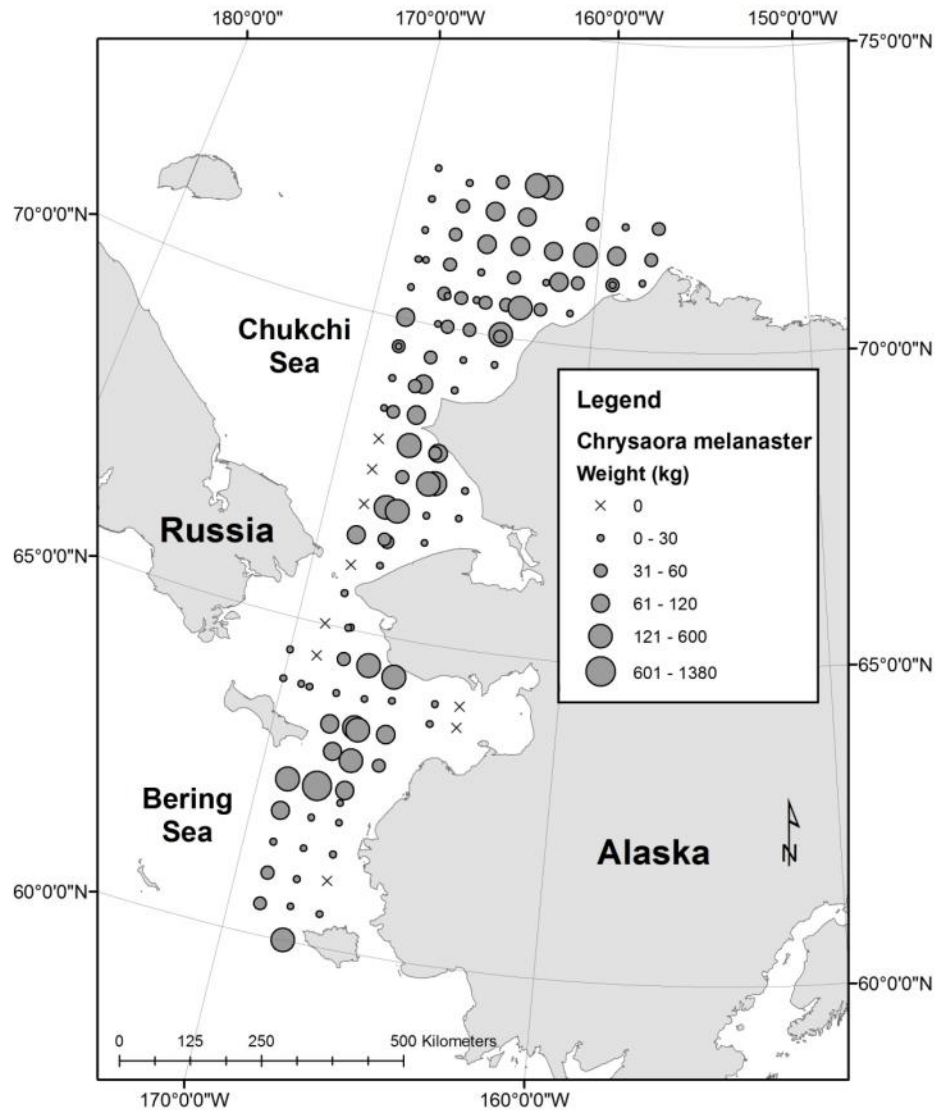
pink salmon

2012 Catch Summary: Surface Trawl

99% *Chrysaora melanaster*

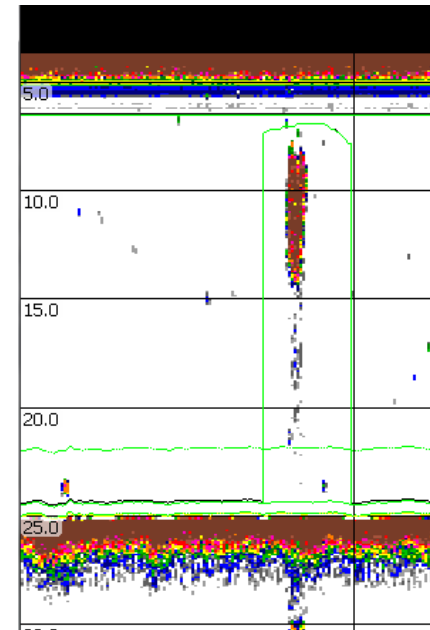
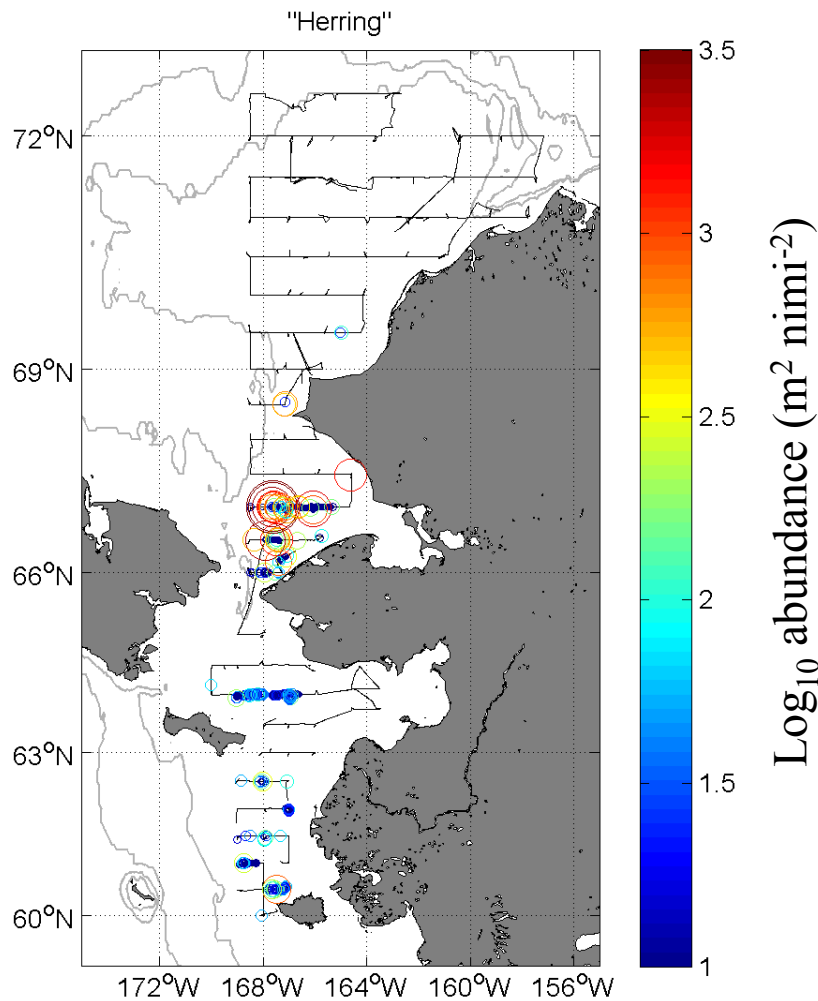


Jellyfish Distribution (surface)



Chrysaora melanaster

Pacific Herring Distribution (midwater)



Backscatter was dominated by herring in the South

Capelin Distribution (surface)

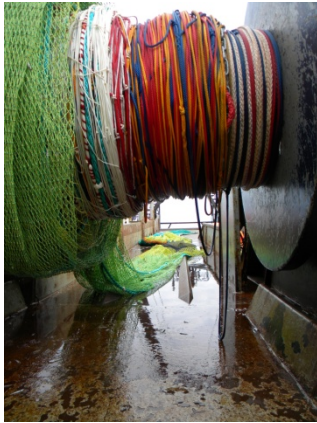
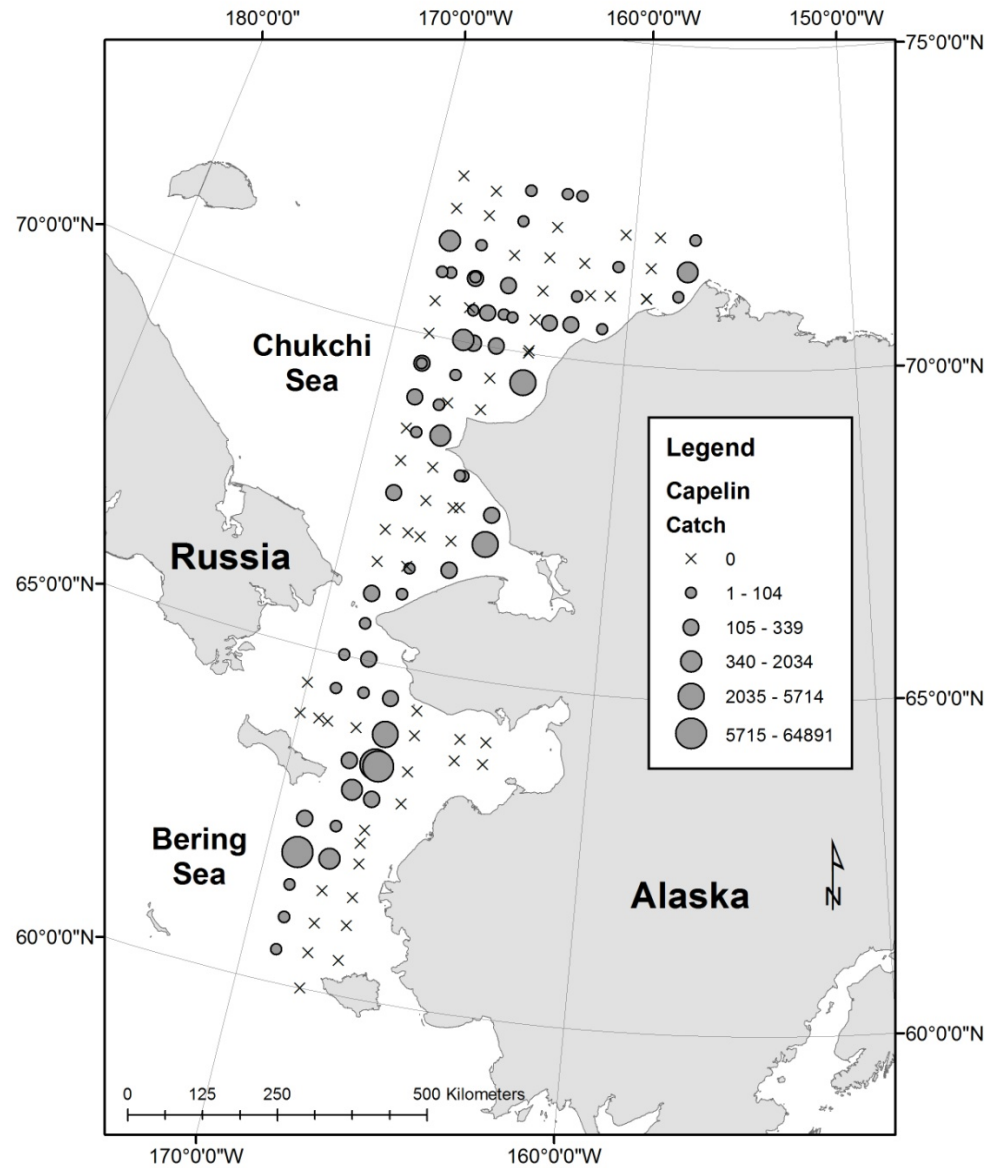


Photo credit: Andrews



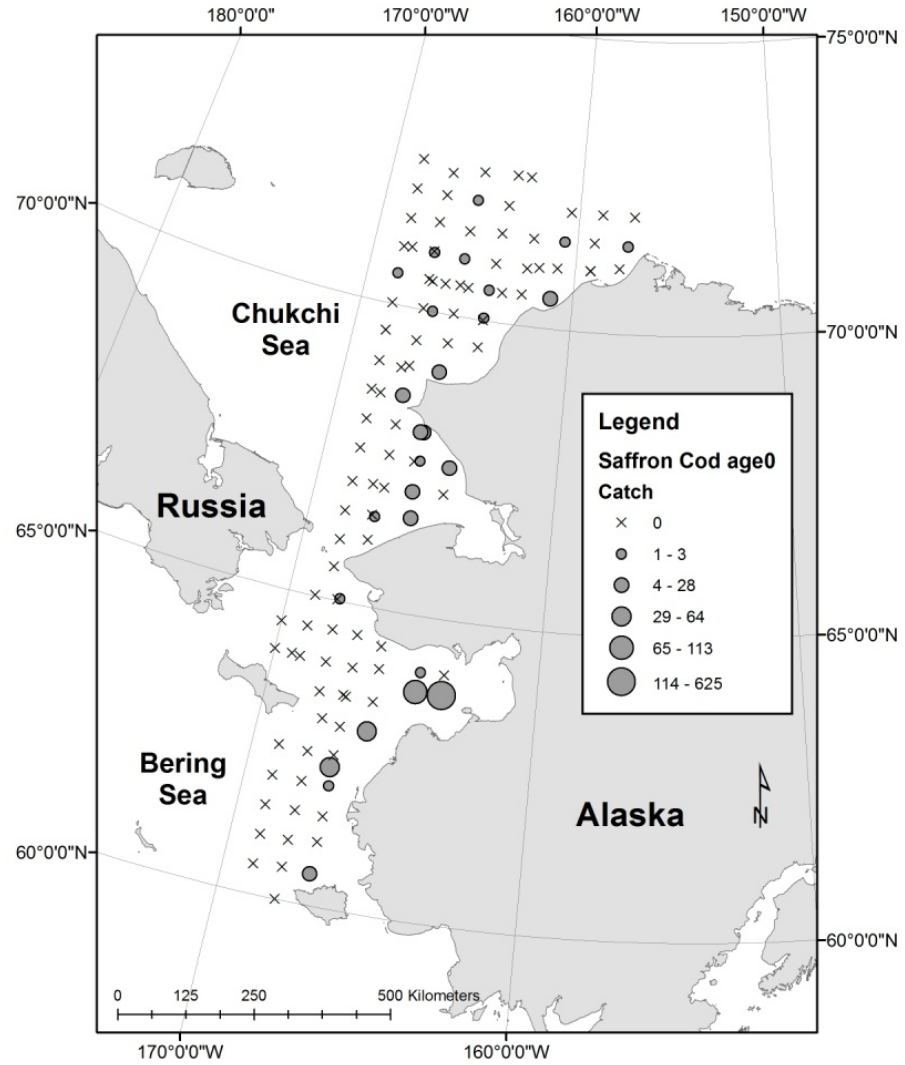
Saffron Cod Distribution (surface)



Photo credit: Andrews



Photo credit: Pham



Arctic cod life history

- Circumpolar distribution
- On bottom or in water column, often associated with ice
- Occasionally in large schools
- Relatively short-lived: 6-7 years maximum
- Mature at age 2-6
- Spawn in nearshore waters during winter
- Eggs & larvae in water column



Mecklenburg & Mecklenburg



Arctic Cod Distribution (surface)

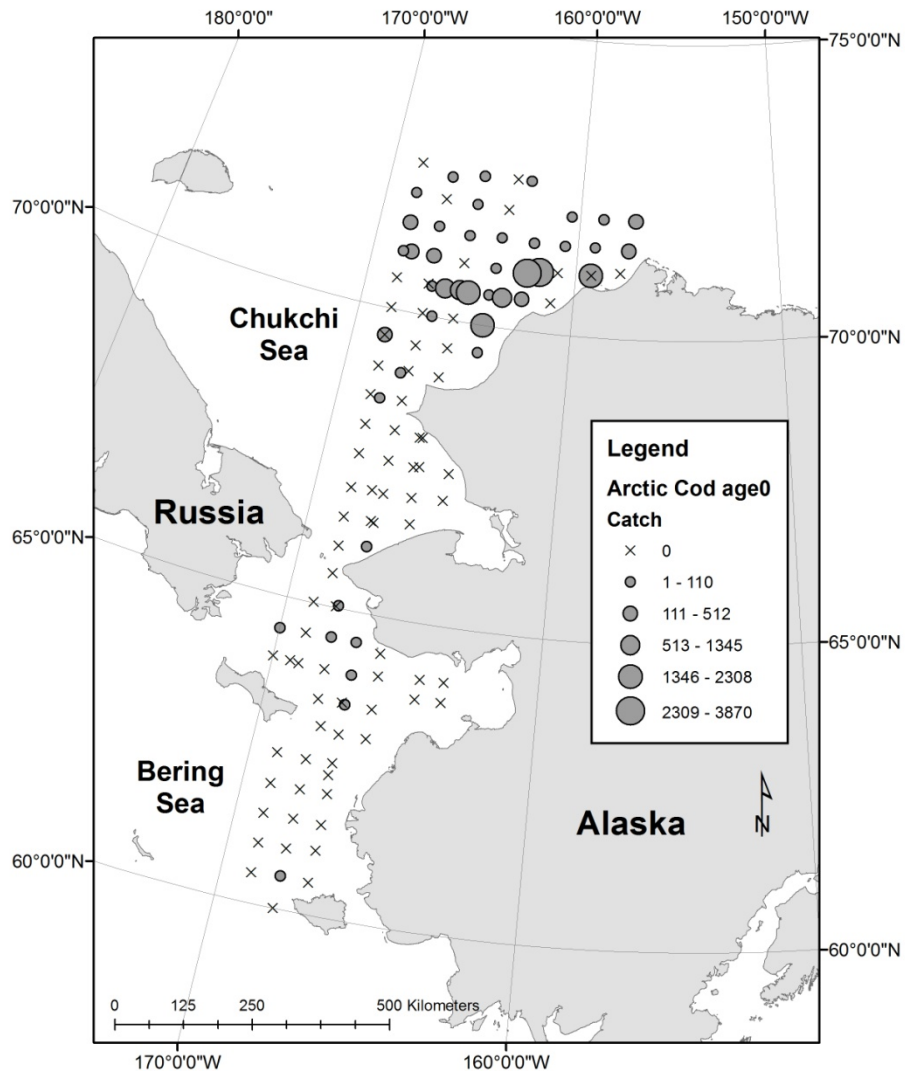
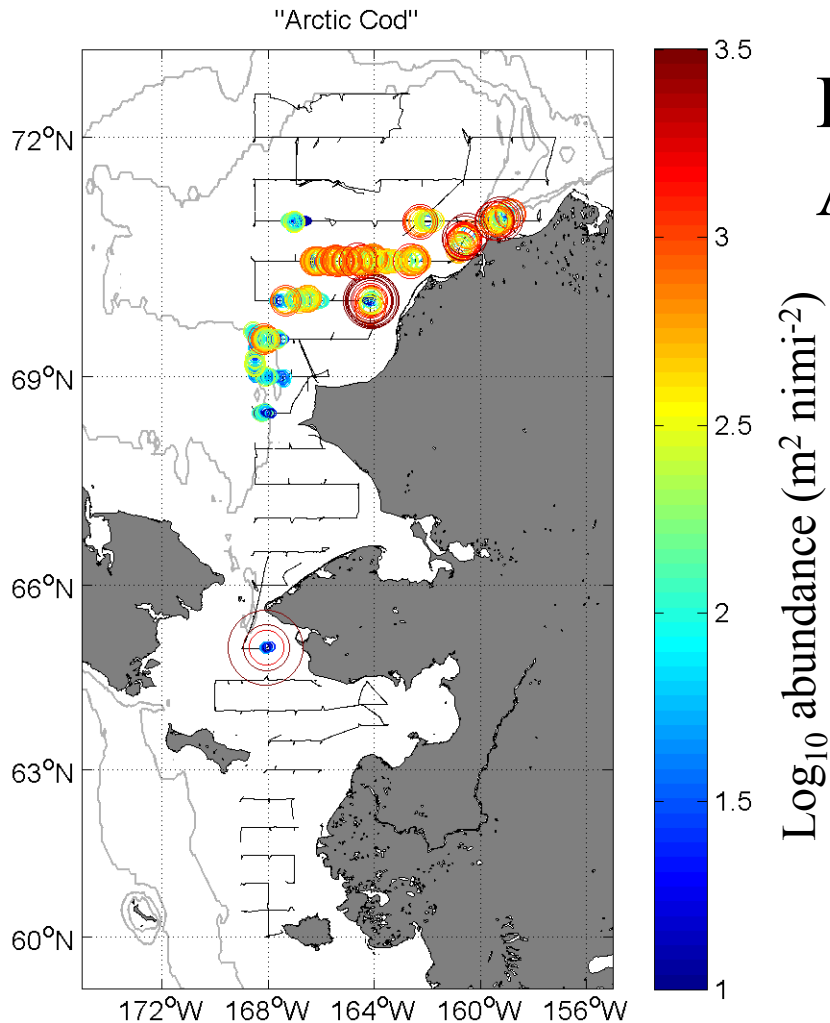
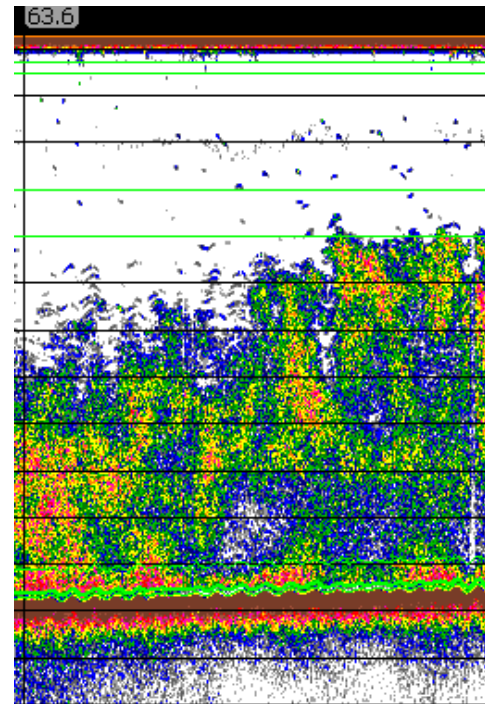


Photo Credit: De Robertis

Arctic Cod Distribution (midwater)

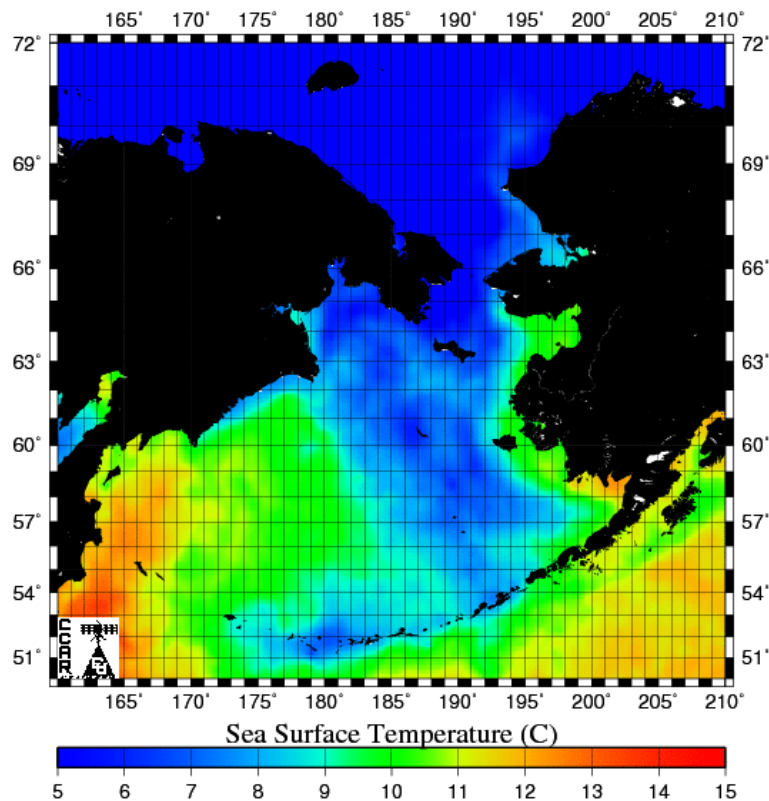


Backscatter was dominated by Age-0 Arctic cod in the north

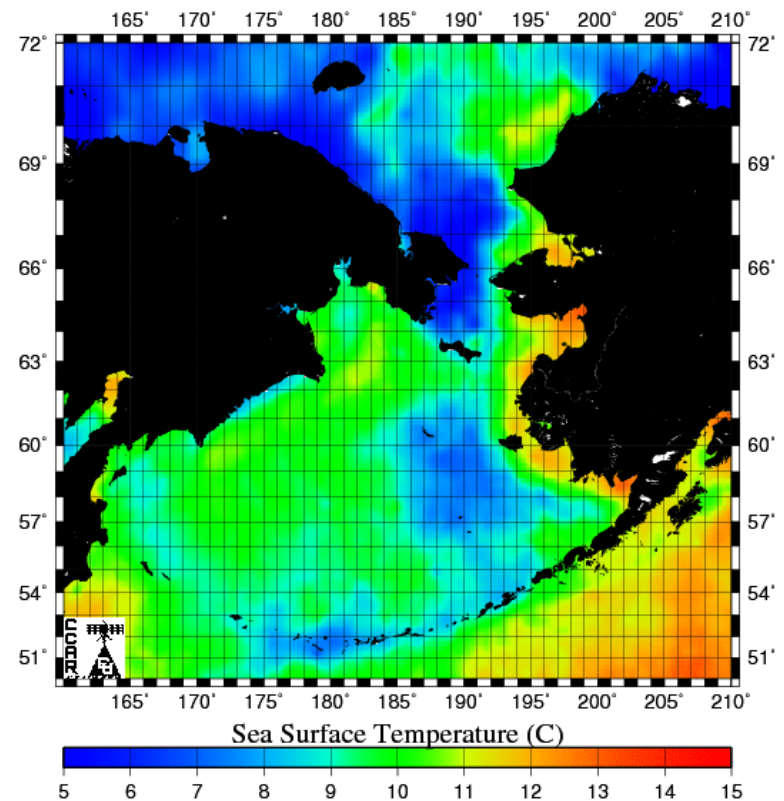


Satellite Derived SST Products

Sep 13 2006

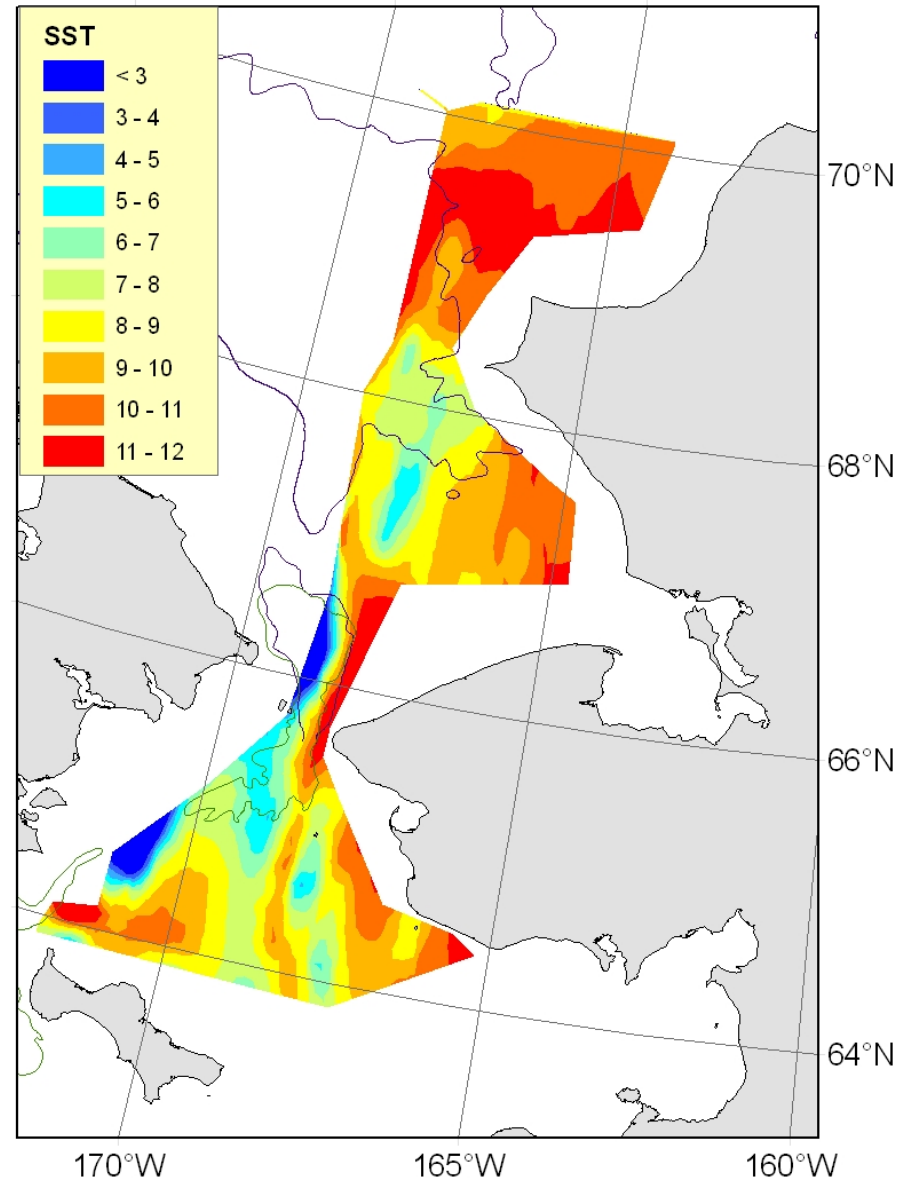
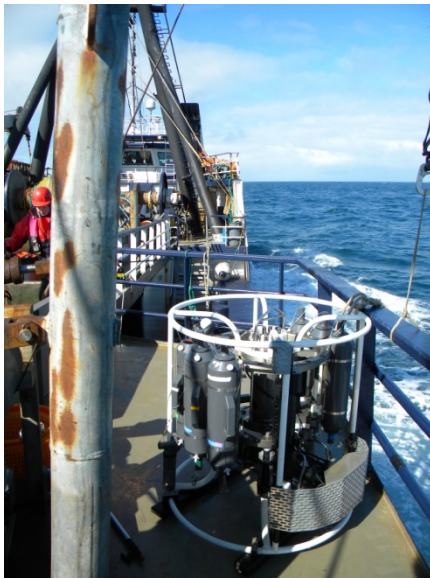


Sep 13 2007



Physical Oceanography - 2007

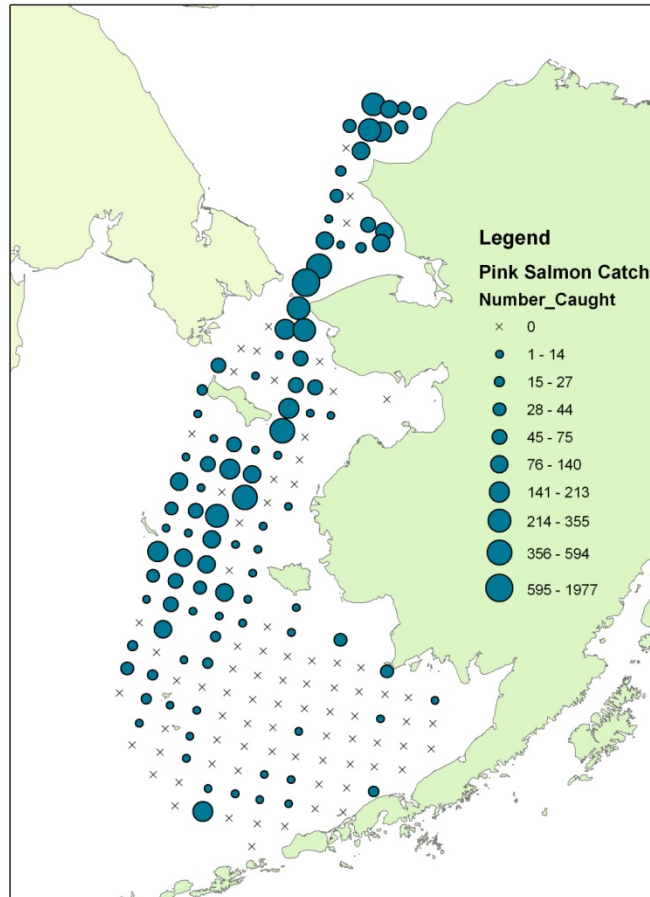
Sea Surface Temperatures



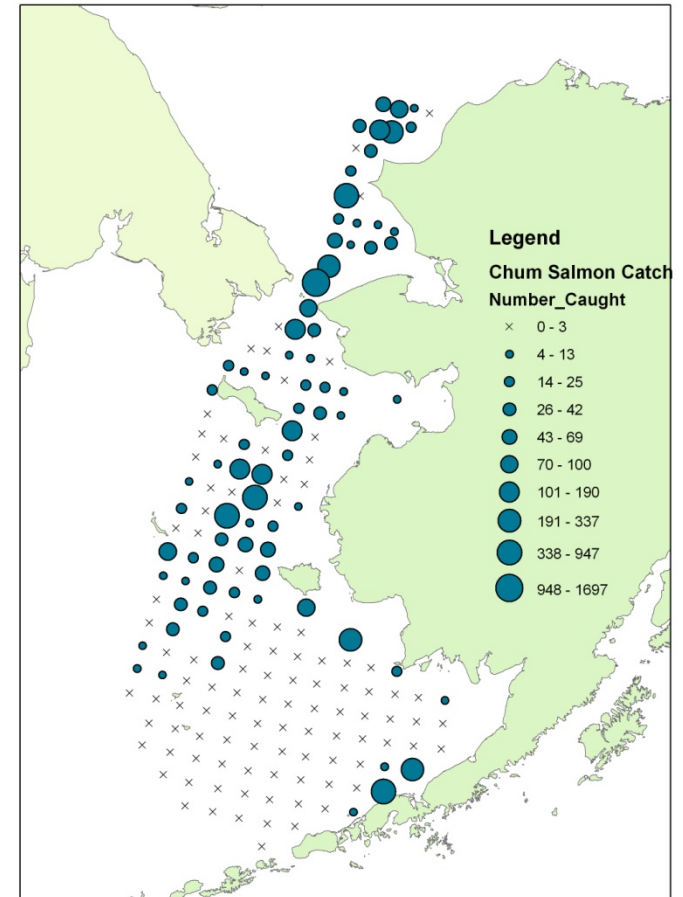
Juvenile Salmon Distribution (Sept. 2007)



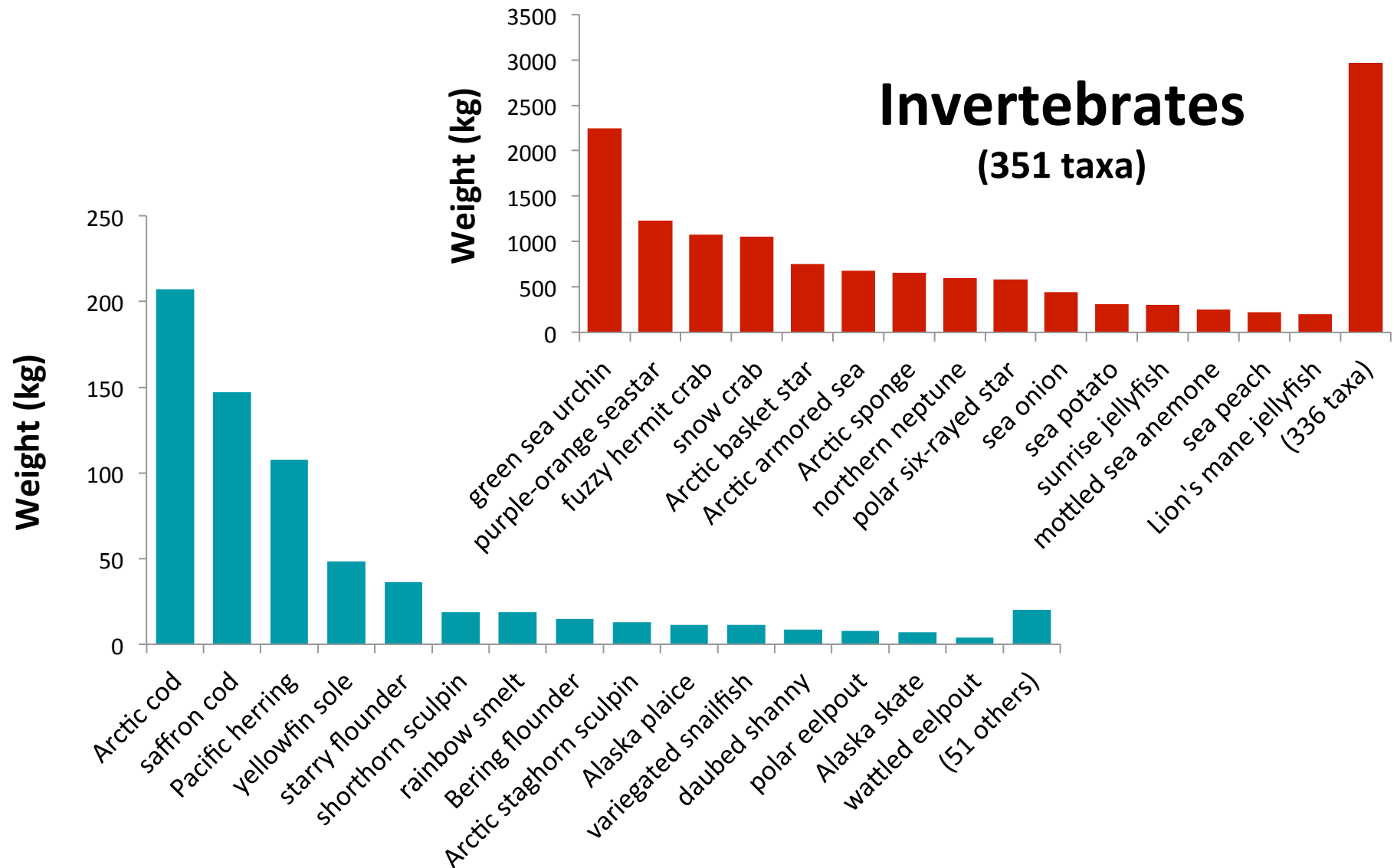
2007 BASIS Juvenile Pink Salmon Catch



2007 BASIS Juvenile Chum Salmon Catch



2012 Catch Summary: Bottom Trawl



Dominant Bottom Trawl Catch

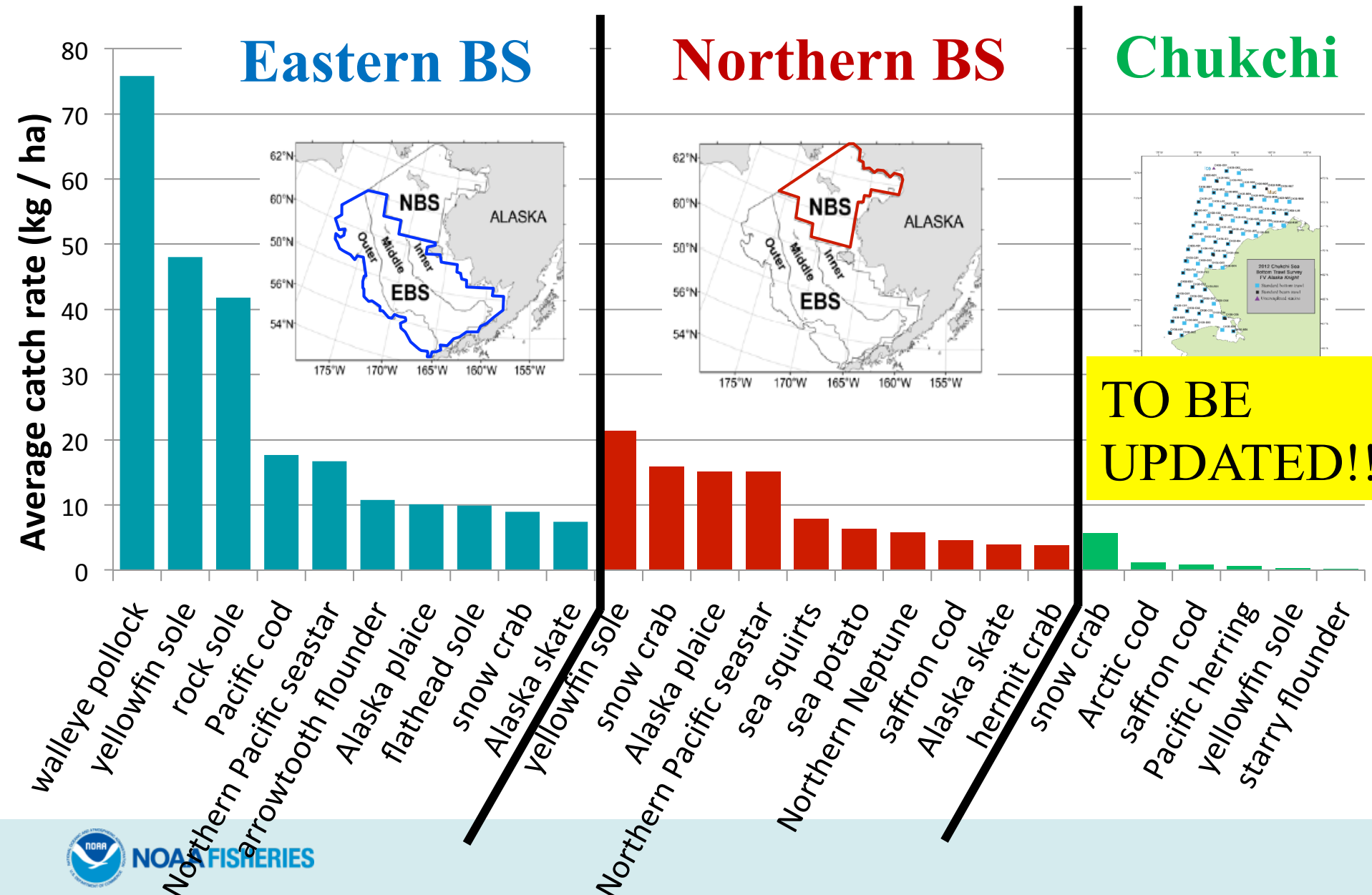
Brittle stars



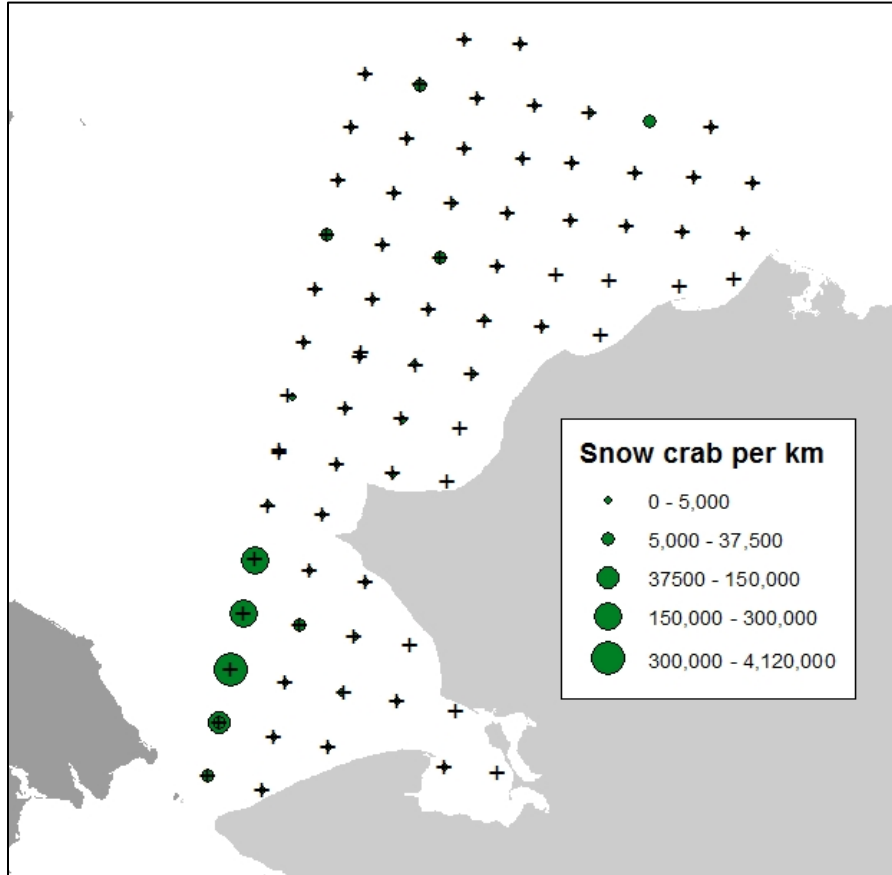
Arctic Cod



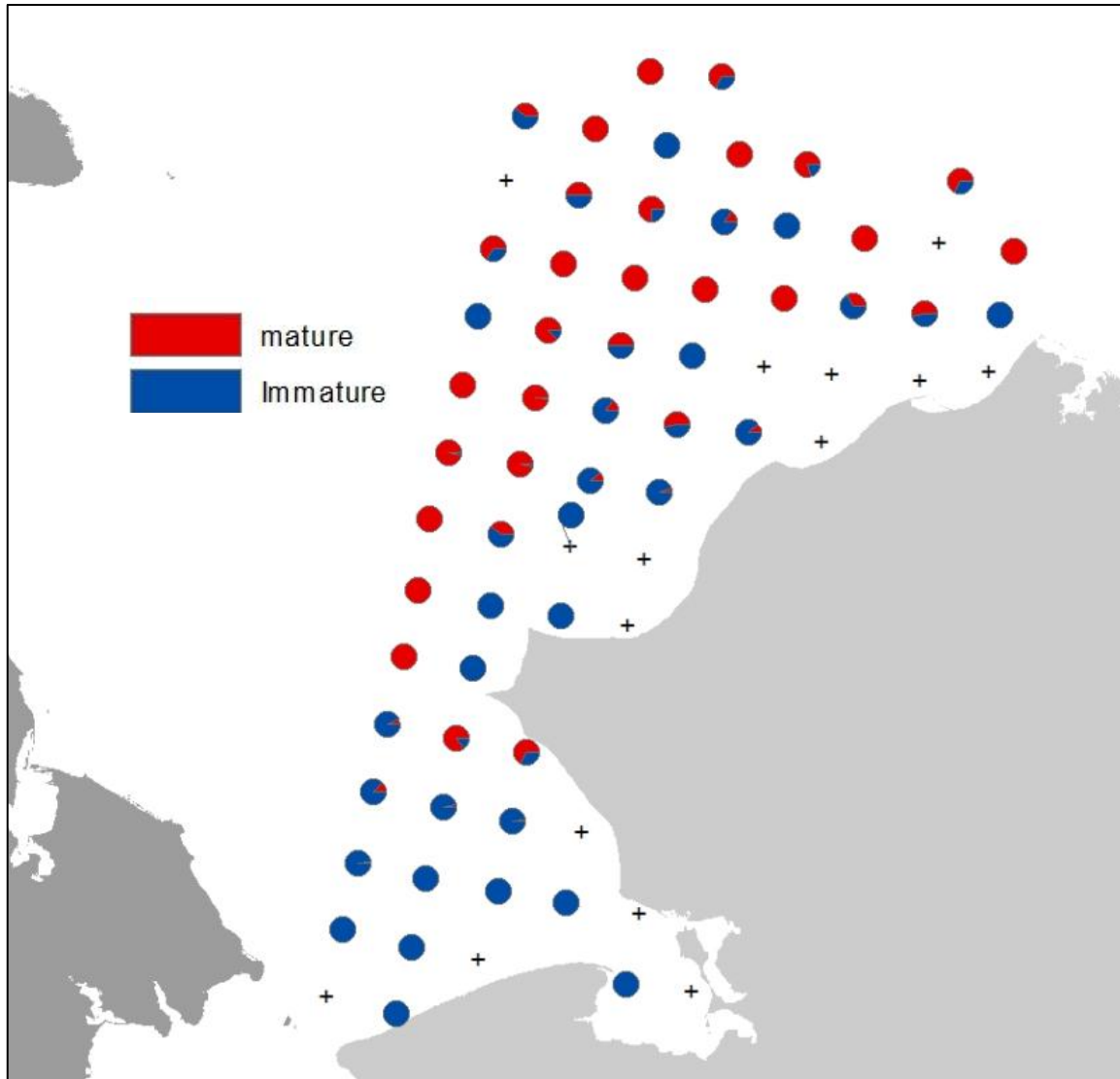
Average density (CPUE) in three areas



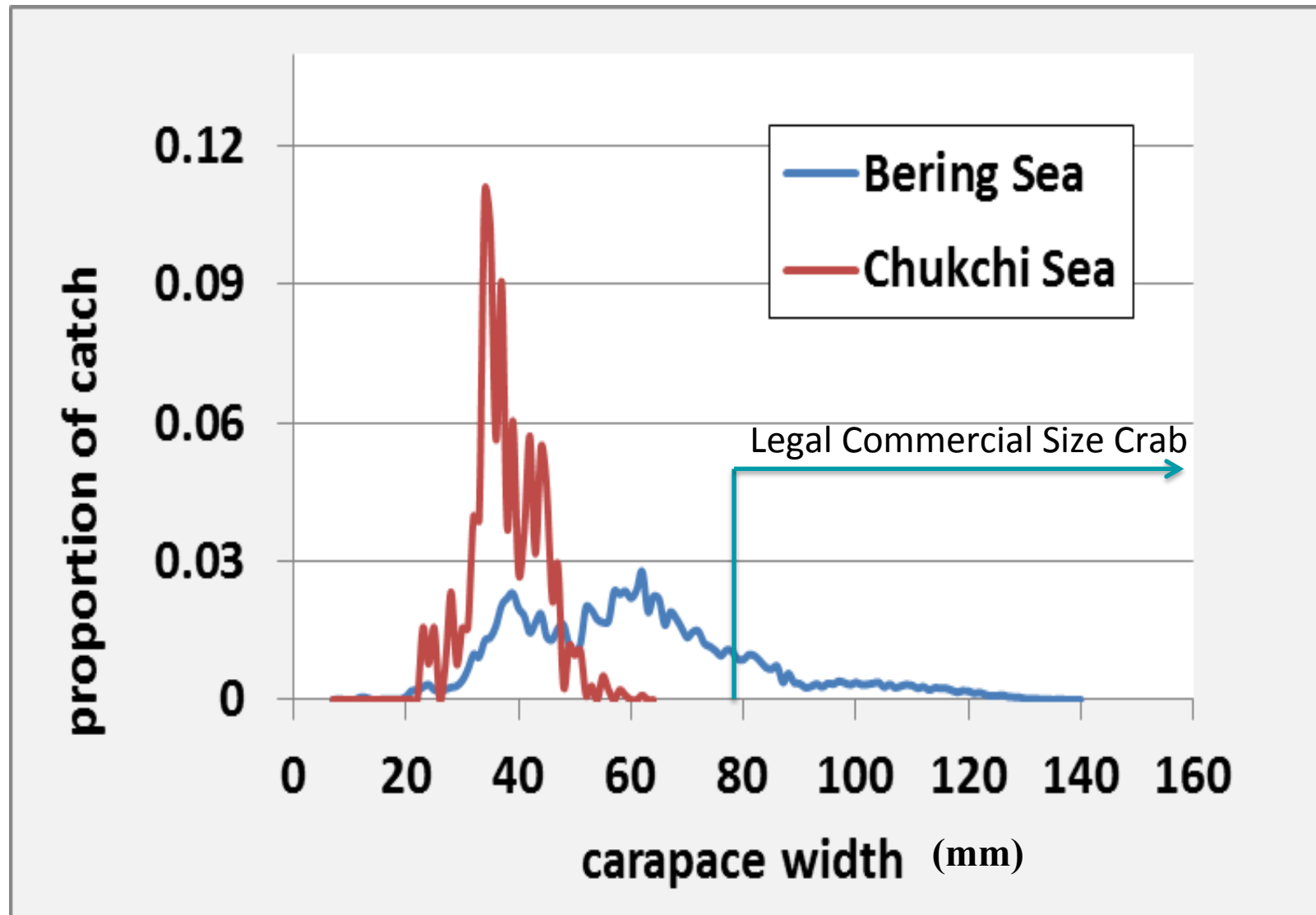
Snow Crab Distribution (Bottom Trawl)



Snow Crab Females



Snow Crab Carapace Width (Bottom Trawl)



Summary and Conclusions

- LOSI (Arctic Eis) will provide a more comprehensive view of the Chukchi Sea fauna from plankton to seabirds
 - Complements existing, more focused surveys
 - Opportunities for collaboration
- Diverse fish & invertebrate fauna with low densities compared to Bering Sea (N-S gradient)
- Arctic species with circumpolar distribution (i.e. Arctic cod) may serve as "bellwethers" of climate change as distribution in marginal seas contracts & expands

